



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 115516SIMS3TV	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/NO 03/00264	International filing date (day/month/year) 31.07.2003	Priority date (day/month/year) 31.07.2002
International Patent Classification (IPC) or both national classification and IPC G06T17/00		
Applicant SIMSURGERY AS et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 26.02.2004	Date of completion of this report 20.10.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Klemencic, A Telephone No. +49 89 2399-6007 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/NO 03/00264**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1, 3-19 as originally filed
2, 2a received on 23.08.2004 with letter of 19.08.2004

Claims, Numbers

1-26 received on 23.08.2004 with letter of 19.08.2004

Drawings, Sheets

1/15-15/15 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/NO 03/00264**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-26
	No: Claims	
Inventive step (IS)	Yes: Claims	1-26
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-26
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1: Lévy B., Mallet J.-L., Cellular Modeling in Arbitrary Dimension using Generalized Maps, 05.01.2001, pp 1-11.

D2: Lang V., Lienhardt P., Simplicial Sets and Triangular Patches, Proceedings of Computer Graphics International, pp 154-163, 24.06.1996

2 **Technical Field:** Irregular mesh description using multi-resolution G-maps.

3 **Closest Prior Art:** Document **D1**, which is considered to represent the most relevant state of the art, discloses G-maps (abstract, Figs. 2-6) used for description of the topology of manifold objects of arbitrary dimensions.

4 **Novelty:** The subject-matter of independent claims differs from that disclosed in document **D1** in that based on the first mesh, coded as a G-map, a refined mesh is created, the coordinates of the refined mesh are used to compute control points and said control points are used to create surface patches associated with said first mesh. The refined mesh is also coded as a G-map.

5 **Problem:** Generation of multi-resolution G-maps.

6 **Inventive Step:**

6.1 In document **D1** (abstract; page 1, right-hand column, line 8) multi-resolution editing is mentioned as a potential field of research but it is not further elaborated and would not lead the skilled person to a particular implementation of claim 1.

6.2 Document **D2** discloses a combination of multi-resolution and half-edges. Half-edges are predecessors of G-maps, but they do not anticipate their structure. The extension of multi-resolution to G-maps is therefore not straightforward.

7 **Clarity, Article 6 PCT**

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/NO 03/00264

Independent method claim 18 gives the detailed steps necessary to create a classical G-map (page 22, line 17 - page 23, line 10) and steps necessary to create a multi-resolution G-map (page 23, line 11 - line 18).

Independent method claim 18 should have been formulated as a dependent claim, referring to independent claim 1 (e.g.: A method according to claim 1, where step of creating said G-map representation comprises the steps of: creating a first data structure ...), because it includes all the features of claim 1 (Rule 6.4(a) PCT) and it only gives further details of some method steps of claim 1.

8 General remarks

- 8.1 Independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT. In addition, the applicant should have ensured that it is clear from the description which features of the subject-matter of claims are already known in combination from the document **D1** (see the PCT Guidelines, III-2.3a).
- 8.2 The features of the claims should have been provided with reference signs placed in parentheses (Rule 6.2(b) PCT).